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A Clean Canada in a Dirty World: The Cost of Climate-Related Border Measures

By
Benjamin Dachis

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- As the federal government weighs policy options for reducing greenhouse gases, the question arises as to how to treat imported goods from countries with less stringent emission targets. One policy option is to impose a "carbon tariff" on imported goods from those countries.
- The imposition of such a border adjustment, however, would have serious drawbacks. The largest share of the burden of any Canadian trade action would be imposed on US imports, not developing countries.
- An extra cost imposed on imports would ripple through the economy, and onto final consumers, and would put Canadian firms at a cost disadvantage in foreign markets.

The failure of the United Nations Climate Change Conference in Copenhagen to reach a binding global agreement to reduce greenhouse gases (GHGs) raises the prospect of a world with fragmented national climate policies. Canada, for example, currently has plans for an intensity based cap-and-trade system intended to reduce emissions by 20 percent relative to 2006 levels by 2020 (Government of Canada 2008). A related policy issue for the federal government is how to treat imported goods from countries with less stringent emissions targets.

One policy option is to make domestic and foreign producers pay the same amount for carbon emissions, known as a carbon border adjustment.[1] However, this *e-brief* argues that a carbon border adjustment, often referred to as a carbon tariff, should not be considered as part of Canada's cap-and-trade proposal.

The imposition of a border adjustment would have many drawbacks. It would face numerous hurdles for World Trade Organization (WTO) compliance. A border adjustment would also be largely unnecessary because most Canadian exports will likely not be subject to US border adjustments, and an equivalent Canadian border adjustment would apply mostly to US goods. Canada, with its numerous global-supply-chain producers, would have much to lose from carbon border adjustments and little to gain.

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1 See Hufbauer (1996) or Otzechowski (2001) for a comprehensive review of border-tax adjustments (BTAs).

Carbon Border Adjustments

A carbon border adjustment would levy a charge on foreign producers of imported goods equivalent to the costs imposed on domestic producers for carbon emissions. This would reflect the carbon permit costs determined through a cap-and-trade system.[2] For example, if carbon permits in Canada traded at a price of $100 per tonne of CO_2 produced, and an imported good released two tonnes of CO_2 in its production, the border adjustment on that good would be $200. The adjustment would apply to imports and/or could involve rebates to domestic exporters for the carbon emission costs they have already paid.[3]

In the future, without global cooperation to reduce emissions, Canada will import from countries that charge producers for carbon emissions and other nations that do not. Canadian producers of goods that emit a large amount of carbon in the production process and compete with foreign producers that do not face a carbon price are likely to be at a competitive disadvantage. Previous literature, however, has found that most relative competitiveness impacts would be assuaged by Canada-US harmonization of carbon policy, with little loss to Canadian production as a result of companies relocating to countries that do not impose carbon pricing (Bataille et al, 2009). Most of the predicted production loss from Canada would be gained by the United States, not by developing countries whose goods are often perceived as targets of border adjustment.

WTO Compliance of a Carbon Border Adjustment

Border adjustments may meet the international requirements for trade legislation, but the details of any proposed carbon border adjustment will raise the issue of WTO compliance.[4] The following issues arise:

- Imports must be treated no less favourably than 'like' domestic goods, a difficult matter of definition in itself (Cosbey 2008);
- "Most Favoured Nation" clauses prohibit discrimination among trade partners;
- Carbon tariffs may also be considered under Article XX of GATT, which allows for general exceptions "necessary to protect human, animal or plant life or health…if such measures are made in conjunction with restrictions on domestic production or consumption." (Fischer and Fox 2009).

Border-tax adjustments (BTAs), as defined by WTO law, are intended for consumption taxes, not carbon permits. For carbon permits, what matters is the method of distribution (Green 2009): emissions permits could be freely allocated to producers or purchased through a government auction. The key defining feature of a tax in the eyes of international law is the existence of a payment to the government (de Cendra 2006). Hence, a full auction of permits would be necessary to potentially meet this definition of a 'tax.'

The other possible application of a border adjustment – rebating domestic producers for carbon abatement costs in the production of exported goods – could be considered over-compensation if polluters do not pay for their emissions permits, making an export rebate from government a subsidy. An export rebate would need to be coupled with a purchase of emissions credits or a carbon tax to be admissible under WTO rules (Ismer and Neuhoff 2007).

2 This border adjustment is often a tax, but can also be a requirement to purchase an emissions credit. The requirement to purchase a permit may be a regulation, but the economic impact is largely the same as a border adjustment (Cosbey 2008).

3 Canada applies the Goods and Services Tax (GST) on imports but the tax is not levied on Canadian exports. Exporters are still able to collect input tax credits for their GST paid.

4 A full discussion of WTO treatment of border adjustments is outside the scope of this e-brief. See Hufbauer et al (2009) for an excellent summary of the WTO issues relevant to BTAs.

The Effect of US Legislation on Canada

Regardless of WTO law requirements, the US has plans to impose border adjustments. In June 2009, the United States House of Representatives passed the *American Clean Energy and Security Act* (ACES). The bill, although not yet law, proposes an economy-wide cap on carbon emissions. Furthermore, the bill proposes a requirement for importers to purchase US credits for foreign emissions as early as 2020, but only under specific conditions.

The first condition is that the US would not impose any border measures if a binding international agreement is in place (Bradbury 2009).[5] Without an international agreement, however, ACES would impose no US border measures if 85 percent of imported goods in a specific sector are from countries that meet at least one of the following three criteria:

- The country is party to an international agreement with the US and has emissions targets at least as stringent as the US;
- The country is party to a multi-lateral or bilateral sectoral agreement with the US suspending border measures;[6] or
- Imports in the trading partner's sector have GHG intensities that are equivalent or below the US sector's GHG intensities.

Based on current GHG-intensities and 2007 export levels, the last criterion would exempt 89 percent of Canadian trade from US border adjustments, leaving only the pulp and paper broad sector potentially vulnerable to US border measures because of higher Canadian GHG-intensities than those in US production.[7]

A Canadian Carbon Border Adjustment

What would a Canadian border adjustment, similar to the US example, look like for industries and provinces? I estimate total revenues from a border adjustment (both from the import and export component) and determine what importers would need to pay to send goods to Canada as a percentage of total industry import value (Table 1).[8] I assume that large emitters must purchase emissions credits from government and that this border measure only applies to goods whose domestic large final emitters are covered by the current emissions reporting system.[9]

A hypothetical $100 per tonne carbon price would create a carbon market of approximately $4.5 to $5 billion amongst large final emitters in industries outside of the oil and gas and electricity sector. I assume that in response to a carbon price, Canadian producers reduce their production, imports and exports along the lines estimated by Rivers (2008).[10]

5 BTAs will not apply to countries responsible for less than 0.5 percent of world emissions or less than 5 percent of US imports in a given sector or to 'least developed countries.'

6 Fickling and Schott (2009) suggest that the current NAFTA does not by itself protect Canadian exports to the US from the imposition of US border adjustments.

7 The broadly defined Canadian pulp and paper industry is more carbon intensive than the equivalent sector in the US because of much higher energy intensity of production, despite the low carbon intensity of electricity and pulping liquor as energy sources (Bataille et al 2009). These relative GHG intensity calculations assume that electricity emission intensities are used in calculating total sectoral emission intensities. Using only facility-own emissions, many more Canadian industries would have higher GHG-intensities than the United States.

8 I link total industry emissions to provincial industry gross output and provincial industry-level international trade. Provincial output is a proxy for facility-level output because provincial output is the finest level of detail that is publicly available. All datasets were merged on six-digit NAICS codes but results are aggregate to the four-digit level. Some corrections were made for slightly inconsistent coding of industrial categories. I also assume that Canadian businesses change their behaviour after the imposition of a carbon price and the border tax adjustment. Emission levels, output, exports, and imports will all be different from the business-as-usual trend after the introduction of a carbon price and any trade measures. I apply the estimated percentage change in these variables for Canadian (not foreign) production relative to the business-as-usual scenario found in Rivers (2008). The policy scenario modeled is for the year 2020, with an import tariff at a level that will prevent imports in any sector from increasing by more than 10 percent or exports decreasing by more than 10 percent. The percentage change by industry category found in the previous analysis was then matched to the closest equivalent in the Canadian and international data.

9 Facility-level reporting of GHG emissions from Environment Canada is used to estimate the amount of emissions by industry and province. Facility-level emissions are available from Environment Canada at http://www.ec.gc.ca/pdb/ghg/onlinedata/DataAndReports_e.cfm

10 This analysis focuses only on emissions-intensive, trade-exposed manufacturing industries. This excludes the electricity, petroleum and oil-and-gas sectors. Electrical and oil-and-gas sector emissions are likely to be treated separately in a border adjustment scheme.

Table 1: Export Rebate and Import Border Adjustment Based on Industry Average Emissions Intensity, $100 per Tonne, 2004 Output Levels and Dollars

Industry	Value of Domestic Emissions *($ millions)*	Export Border Adjustment *($ millions)*	Import Border Adjustment *($ millions)*	Import Border Adjustment as percent of Industry Imports
Cement	945	170	55	63.2
Lime	205	6	5	27.2
Iron and steel mills and ferro-alloy	1,120	356	790	11.6
Alumina and aluminum	564	440	165	9.6
Metal ore mining	221	226	80	7.4
Pesticides and fertilizer	397	114	48	3.6
Non-metallic mineral mining and quarrying	42	51	0	2.3
Non-ferrous metal (except aluminum) smelting and refining	31	26	1	2.0
Non-metallic mineral mining and quarrying	180	149	47	1.9
Pulp, paper and paperboard mills	459	156	54	1.3
Glass	23	2	15	1.2
Food manufacturing	27	8	8	0.5
Basic chemicals	490	15	28	0.3
Steel foundries	1	0	0	0.1
Resin and synthetic rubber	5	2	3	0.1
Automobile manufacturing	38	29	16	0.1
Total	**4,746**	**1,752**	**1,314**	**1.9**

Sources: Author's calculations from Industry Canada. "Trade Data Online." Environment Canada Facility GHG Reporting. CANSIM Table 381-0015.

I assume importing firms pay a rate equal to average domestic emissions intensity, not actual foreign emissions. The estimates in Table 1 do not include the possibility of exemption for some imports. This is thus an upper bound estimate on the impact of border adjustments.

The best measure of the relative cost of a border adjustment on trade is the value of the revenue from import tariffs as a share of industry imports. The good most affected by an import tariff would be cement, where every dollar of imported cement would have 63 cents of tariff levied. Other carbon-intensive sectors, such as lime, aluminum products, and metal ore mining would be subject to import tariffs of over 5 percent of the value of imports. A rebate of all Canadian emissions permit costs on exports, similar to that proposed by ACES, would return more money to Canadian exporters than would be collected on imports (columns 2 and 3), resulting in a windfall for many domestic producers, but at the expense of domestic consumers, taxpayers and importing firms.[11]

Although not reported in the table below, Ontario and Quebec producers would bear a considerably heavier burden of import border adjustments as firms in these provinces import goods that would likely be subject to more border adjustments than western Canadian firms. An import tariff would represent about 1.7 percent of the total value of Ontario and Quebec imports subject to a border adjustment, but would only be 0.3 percent of the value of Alberta imports.

11 Canada is one of the few OECD countries to have exports that are more carbon intensive than imports (Nakano et al 2009).

Table 2: Import Border Adjustments, by Country, 2004 Trade Levels

Region	Import Border Adjustments as Percentage of Value of Affected Trade	Import Border Adjustments as Percentage of Value of All Trade	Import Border Adjustments *($ millions)*
Developing[a]	3.6	0.3	187
Oceanic and East Asia[b]	1.4	0.4	101
EU	2.4	0.3	141
United States	2.0	0.4	791
Total	2.1	0.3	1,220

Notes: a: Developing includes Argentina, Brazil, China, India, Indonesia, Israel, Malaysia, Mexico, Philippines, Russia, South Africa and Turkey.
b: Oceanic and East Asia includes Australia, New Zealand, Taiwan, Japan, Singapore, South Korea and Hong Kong.
Estimated import border adjustments collected are different than those estimated in Table 1 because this table is limited to only major trading partners, whereas the industry-level estimate is calculated for all trade.
Sources: Author's calculations from Industry Canada "Trade Data Online," Environment Canada Facility GHG Reporting, CANSIM Table 381-0015.

Of the estimated $1.3 billion that would be collected from an import border adjustment nearly $800 million would be levied on US imports (Table 2). The proceeds of a border adjustment would represent a larger share of the value of affected trade from developing countries without strict climate controls, but would represent only approximately 15 percent of total import border adjustments collected.[12]

Importantly, all of the above results only estimate the impact of hypothetical border adjustments on basic goods, such as iron or aluminum, and not on the production of manufactured goods that use imported products as inputs. A border adjustment would therefore protect domestic producers of these basic goods, but would harm domestic manufacturers who use imported products as inputs. An extra cost imposed on imports would ripple throughout the economy onto final consumers and would put Canadian firms at a cost disadvantage in foreign markets. Many Canadian firms are integrated into global supply chains, adding value at many stages of production. The adversely affected sectors represent a much larger share of total Canadian trade than do firms producing basic goods (Beckman and Goldfarb 2007), and tracking embodied emissions in value chains would create significant challenges.

Conclusion

While few Canadian sectors are likely to face a US border measure, the largest share of the burden of any Canadian trade action would be imposed on US imports. Most competitiveness issues arising for Canadian firms that would be affected by domestic carbon reduction policies should, preferably, be dealt with through harmonizing Canada and US climate policies. A border measure applied to Canadian imports and exports would be difficult to implement and, on the whole, do more harm than good in terms of rising costs for Canadian producers and consumers. It would set a dangerous precedent for a small, open trading nation like Canada, and should therefore not be part of any potential Canadian policy to reduce carbon emissions.

12 The proceeds of a border adjustment that attempts to estimate actual foreign emissions would be a much larger share of trade with developing countries and would be more trade distortionary (Mattoo et al 2009).

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Benjamin Dachis is a Policy Analyst at the C.D. Howe Institute.

For more information call Benjamin Dachis at 416-865-1904.

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